

**DC-TO-DC POWER REGULATOR HAVING NON-LINEAR LOAD LINE
AND AUTOMATIC LEAKAGE CURRENT OFFSET ADJUSTMENT**

ABSTRACT

A voltage regulator exhibits a load line that is piecewise linear. This piecewise linearity variation has a first constant voltage segment V_{LEAK} at which output voltage is regulated for output currents less than or equal to the leakage current I_L . The output voltage V_{LEAK} corresponds to the maximum output voltage allowable at the leakage current for a given operational range specification. The piecewise linearity variation further includes a second, linearly decreasing segment that varies from the maximum allowable output voltage V_{LEAK} at the leakage current to a full load voltage V_{DROOP} at full load current I_{FL} . This serves to effectively maximize the available output voltage swing in the presence of a leakage current offset. The piecewise linear load line is adjustable to accommodate changes in leakage current.